

DISCUSSION OF THE AMENDMENT

Claims 1-6, 8-9, 11-12, 14-29, 32-37, and 39-?? are active in the present application.

Claims 7, 10, 13, 30-32, and 38 are canceled claims.

The previously presented claims are amended for matters of form.

**New Claims 41-?? are added. Support for new Claim 41 is found on page ?, lines  
?.**

No new matter is added.

### REMARKS

The Office rejected the previously presented claims as obvious over Girotti (EP 0847 802). The Office acknowledges that Girotti uses a beta zeolite (see page 3 of the June 18, 2008 Office Action). The Office takes the position that Girotti “discloses that zeolite Y has been widely used as alkylation/transalkylation catalyst by different inventors and that zeolites generically are active alkylation catalysts” (see the paragraph bridging pages 3 and 4 of the June 18 Office Action).

Applicants traverse the rejection on the grounds that the Office’s characterization of Girotti’s disclosure with regard to the known uses of zeolite Y is not correct. In essence, the Office mischaracterizes the Girotti disclosure and improperly relies on the mischaracterization as a basis for the rejection.

For example, the Office cites to page 4, lines 1-22; page 2, lines 18-24; page 3, lines 2-4 and 19-20; and page 2, lines 27-28 in support of the rejection. First, with respect to the Office’s citation to page 4, lines 1-22 of Girotti, the alkylation and/or transalkylation catalytic composition is one that is described as “consisting of” beta zeolite and an inorganic ligand. This disclosure in Girotti is specific to catalytic compositions that contain beta zeolite. There is no disclosure or suggestion that beta zeolite may be substituted for any other type of zeolite or any other material.

Thus, one of skill in the art reading Girotti would be led to conclude that beta zeolite must be the zeolite present in the catalytic composition, not another zeolite and not zeolite Y.

Although the Office cites to page 3, lines 18-19 of Girotti as support for the assertion that one of ordinary skill in the art would substitute zeolite Y for beta zeolite, Applicants submit the cited disclosure is contradictory to the Office’s assertion. The Office’s assertion that “Girotti also discloses that zeolite Y has been widely used as alkylation/transalkylation catalyst...” is not correct. The above-cited disclosure makes it clear that the subject is the use

of beta zeolite “as alkylation catalyst” (see page 3, line 19 of Girotti), not a transalkylation catalyst. The transalkylation of aromatics is referenced only with respect to a subsequent study using beta zeolite (see page 3, line 21 of Girotti). The Office’s assertion that different inventors have used zeolite Y as alkylation/transalkylation catalyst is therefore not correct.

The same may be said for the Office’s citation to page 3, lines 2-4 of Girotti. While the cited portion of Girotti may disclose that zeolite Y has been used in transalkylation reactions with benzene, the zeolite Y is identified as a particular zeolite Y, namely, a zeolite Y “exchanged with rare earth” (see page 3, line 4 of Girotti). Again, where the Office asserts that zeolite Y has been widely used by other inventors in alkylation/transalkylation reactions, the explicit disclosure of Girotti contradicts the Office’s assertion.

The Office likewise cites to page 2, lines 18-24 of Girotti as an alleged teaching that zeolite Y has been widely used by other inventors for alkylation/transalkylation reactions. However, if one reads the cited disclosure it is clear that the Office has mischaracterized the Girotti disclosure and expanded the disclosure in a manner inconsistent with the disclosure of the Girotti patent. In fact, page 2, lines 18-24 of Girotti relates to the use of X and Y zeolites for the preparation of cumene and subsequent work relating to the alkylation of benzene with light olefins using X and Y zeolites.

Again, the Office improperly mischaracterizes the Girotti disclosure. Far from teaching that other inventors have used zeolite Y as alkylation/transalkylation catalyst compositions, the disclosure at page 2, lines 18-24 refers only to a particular alkylation reaction. The Office’s assertion that this disclosure refers broadly to alkylation/transalkylation catalyst is therefore not correct.

Further with regard to the Office’s reliance on page 2 of Girotti, lines 27-28 refer specifically to “the alkylation of aromatics” (see page 2, line 27 of Girotti) and not generically to the alkylation/transalkylation reactions referred to by the Office. Further

reading page 2, lines 27 *et seq.* shows that Girotti refers to a number of secondary reactions and/or side reactions that may complicate the use of the catalytic composition. The Office appears to give this disclosure of Girotti no weight as a contradictory teaching towards the presently claimed invention.

The same may be said with respect to the Office's citation to page 8, lines 30-31 of Girotti. There is no disclosure of the use of zeolite Y as transalkylation catalyst. Girotti instead discloses the use of beta zeolite as an alkylation catalyst (see also page 3, lines 18-19).

As is the case with the Office's other pinpoint citations to Girotti, the underlying text fails to disclose that it was conventional in the art to use zeolite Y for alkylation/transalkylation purposes.

It is further pointed out that none of the disclosure cited by the Office in section no. 8 on pages 3 and 4 of the June 18 Office Action specifically refer to a zeolite Y having the porosity and binder compound characteristics recited in the present claims. This is especially relevant with respect to the porosity characteristics of the Girotti catalytic composition.

For example, the Girotti composition has the following porosity characteristics:

a catalytic composition ... consisting of beta zeolite ... and an inorganic ligand, ... wherein the ... porosity obtained by adding the mesoporosity and macroporosity fractions ..., is such that a fraction of at least 25% is composed of pores with a radius higher than 100 Å, ... [and] a total volume of extrazeolitic pores greater than or equal to 0.80 ml/g.

See the Abstract of the Girotti publication.

Because Girotti discloses a catalytic composition having a certain fraction of pores with a radius higher than 100 Å, the corresponding fraction is the same for pores having a diameter of higher than 200 Å.

In contrast, the present Claim 1 is drawn to a catalytic composition contains zeolite Y and “wherein at least 30% of [the pore] volume consist of pores with a diameter greater than 100 nanometer”. Applicants submit that it is readily recognized by those of skill in the art that a pore diameter of 100 nanometers corresponds to a pore diameter of 1,000 Å, i.e., a radius greater than 500 Å. Girotti provides no direction to those of skill in the art that a catalytic composition having such porosity characteristics is substantially improved in comparison to the porosity characteristics described in the Girotti publication.

The examples of the present specification highlight the improved performance achieved with the catalytic composition of the claimed invention and tend to support a determination of non-obviousness for the present claims. For example, the total extra-zeolitic porosity for an embodiment of the invention is calculated in the first full paragraph on page 23 of the present specification according to a formula provided on line 14. The extra-zeolitic porosity value obtained for a catalytic composition of the invention is 34.5%. If the same calculation is carried out to determine the extra-zeolitic porosity of a catalytic composition according to Girotti having a radius of 100 Å or greater, the following result is obtained:

$$(0.40 \text{ (cc/g)}/0.84\text{(cc/g)}) \times 100 = 47.71\%.$$

Comparative Example 3 on page 28 of the present application likewise provides a calculation of extrazeolitic porosity. The calculation carried out for the example is as follows:

$$(0.02 \text{ (cc/g)}/0.44\text{(cc/g)}) \times 100 = 4.5\%$$

The same calculation may be carried out to find the fraction of extra-zeolitic porosity having a diameter greater than 20 nanometers as follows:

$$0.14\text{(cc/g)}/0.44\text{(cc/g)} \times 100 = 31.8\%$$

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~~Example and Comparative Example 4 of the present application also provide a useful~~  
comparison. Example 2 and Example 4 are carried out under the same operating conditions

(see page 30, lines 4-6). Inventive Example 2 provides higher conversion and yield in comparison to Example 4. The relative improvement of Example 2 in comparison to Comparative Example 4 is set forth on page 30, lines 19-22.

The difference between Example 2 and Comparative Example 4 is the use of the catalyst of Example 1 in the process of Example 2 and the catalyst of Example 3 in the process of Comparative Example 4. The relative differences in the extra-zeolitic pore diameter of the catalyst compositions of Example 1 and Comparative Example 1 are evident by comparing Figure 3 (inventive) and Figure 5 (corresponding to Comparative Example 3). The catalyst of the comparative example has an extra-zeolitic porosity fraction of 0.04% (see page 28, lines 14-20) whereas the inventive example has an extra-zeolitic porosity fraction of 34.5% (see page 23, lines 11-17).

Applicants have thus demonstrated the importance of the requirement that at least at least 30% of the pore volume consists of pores with a diameter greater than 100 nanometers.

The extra-zeolitic porosity fraction of the examples of Girotti can be calculated by referring to the Girotti figures. For example, in Example 4 an extra-zeolitic porosity fraction can be calculated by applying data derived from Figure 2. The resulting calculation follows:

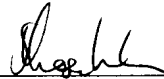
$$(0.02(\text{cc/g})/0.81(\text{cc/g})) \times 100 = 2.4\%$$

Thus, in the example 4 of Girotti the extra-zeolitic porosity fraction of pores having a diameter higher than 100 nm is equal to 2.4%. Clearly this is outside the present claim limitation which requires an extra-zeolitic porosity fraction of pores having a diameter greater than 100 nm of more than 30%.

For the reasons discussed above in detail, Applicants submit the presently claimed catalytic compositions are patentable over the cited art and request allowance of all now-pending claims.

Respectfully submitted,

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